Project Name:	Department of Energy BMIS-FM
Project Number:	BMIS-FM Phase I
DOE Proj Mgr:	Michael Fraser
IBM Proj Mgr:	Don A. Cox, PMP

TESTING STRATEGY for

Department of Energy BMIS-FM Project

Deliverable ID: *APP 141 Testing Strategy*
Version number: *1.02*
Draft/Final as of: 20 Dec 2000
Printed on: 04 Jan 2001
Author: *Benjamin Joyce, Deputy Program Manager*
Joyceb@saic.com

Owner: *Michael Fraser, DOE Project Manager*

Project Name:	Department of Energy BMIS-FM
Project Number:	BMIS-FM Phase I
DOE Proj Mgr:	Michael Fraser
IBM Proj Mgr:	Don A. Cox, PMP

Document information

Document source

This document is maintained as an online document. Contact the author for the latest version.

Revision history

Version number	Date	Summary of changes	Revised By
1.01	*13 Nov 00*	First version	Benjamin Joyce, SAIC
1.02	*20 Nov 00*	Revised after review by M Fraser	Benjamin Joyce, SAIC

Approvals

The following people have approved this document. (Sign below name)

Name	**Function**
Michael Fraser	DOE Program Manager
Signature	**Date:**

Don A. Cox	Team IBM Program Manager
Signature:	**Date:**

Distribution

This document has been distributed to:

Name	**Function**

TESTING STRATEGY

1. Purpose and Objectives of the Testing Strategy

1.1. The BMIS-FM project replaces and expands upon the functionality of several existing systems currently in use at DOE. These include DISCAS, MARS/FIS and FDS. In addition, the project includes interfaces with two key sources and users of financial information; integrated contractors and 17 identified legacy systems. The test strategy document provides a high-level overview of the of the project's approach to testing. The strategy addresses characteristics of the system to be configured, at the application level and at the hardware/operating system level. The strategy also looks at the critical nature of the project to the organization's line-of-business, project timeline and budget and then develops a testing framework that fits within those parameters. The effect of the testing strategy and its testing framework will influence tasks related to detailed test planning, test levels, test script development and executing test scenarios.

1.2. The objectives of this testing strategy and the testing plan include:

1.2.1. To identify deficiencies in the baseline software as early in the process as possible so that they may be reported to the vendor and corrective or mitigating action taken in a timely manner.

1.2.2. To highlight incorrect assumptions or other errors in solution designs or recommendations and provide adequate time for corrective actions.

1.2.3. To optimize the testing process and maximize the efficiency of testing resources though execution of a leveled, defined testing process tied to specific events and timelines.

1.2.4. To determine the external systems interface testing requirements as early in the planning process as possible, given the known distributed nature of the 17 identified systems.

1.2.5. To determine the levels of testing needed by test target or task.

1.2.6. To ensure that applications as deployed accurately capture, display and report operating data from DOE activities.

1.2.7. To ensure that performance of the system, once implemented, will achieve pre-defined standards and enable DOE staff to perform their job in a timely manner.

2. Description of Activities, Deliverables and Transitions

2.1. Prepare For and Conduct a Testing Strategy Workshop

2.1.1. Because of the critical nature of testing, and the variance in philosophies as to approach and execution, it is useful to conduct a Testing Strategy Workshop to discuss all factors associated with a comprehensive, structured testing strategy that will meet the objectives of the BMIS-FM project. In the workshop it is necessary to:

2.1.1.1. Identify levels of testing (unit, integration, system, link, regression, etc.)

2.1.1.2. Develop operational terms and definitions

2.1.1.3. Establish a defined context with key individuals on the project team

2.1.2. In this step, key testing leaders on the IPT are identified, originating sources for testing templates are also identified.

2.1.3. Results of these activities begin to set the framework for the scope and approach for delivering the required testing.

2.2. Conduct Testing Strategy Workshop

2.2.1. In this step, key testing leaders confer and jointly agree on high-level testing parameters. Parameters include performance requirements listed by DOE and setting target levels for testing.

2.2.2. This testing strategy will apply to the following software areas:

2.2.2.1. DISCAS/MARS/FDS: conversion of business rules, opening balances and financial reporting to the Oracle Federal Financial software suite as listed below.

2.2.2.2. 17 External System interfaces as identified in the DOE Request for Proposal document “BMISFM Interface List RFQ2c 5042000.xls”.

External Interfaces: SYSTEM NAME
1. Automated Standard Application for Payment (ASAP)
2. Corporate Human Resource Information System (CHRIS)
3. Electronic Commerce Web (EC-Web)
4. Integrated Contractor Interface
5. Labor Distribution System (LDS)

6. Non-integrated Contractor Interface
7. Obligation Doc and Invoice Status Inquiry (IVR)
8. Obligation Doc and Invoice Status Inquiry Web (VIPERS)
9. Payroll/Personnel System (PAY/PERS)
10. Procurement and Assistance Data System (PADS)
11. Standard Field Funds Distribution Interface
12. Travel Manager Plus
13. Windows System approach to grants Administration (WinSAGA)
14. Electronic Certification System (ECS)
15. Federal Agencies Centralized Trial-balance System (FACTS)
16. Federal Agencies Centralized Trial-balance System II (FACTS II)
17. Host to Host

2.2.2.3. Properly configured Oracle Federal Financial Software version 11.03 modules:

- General Ledger
- Accounts Payable
- Accounts Receivable
- Purchase Order – specifically Funds Control/Funds Check
- Fixed Asset
- Project Accounting
- EDI Gateway

2.2.3. As a result of the Test Strategy Workshop, the approach to BMIS-FM testing will recognize several testing levels. Several levels may be considered. These levels, for the most part, logically build on one another:

2.2.3.1. Module Testing: Also known as unit testing; at this level, software configuration analysts working directly with their Federal project team counterparts will conduct testing on the following functions:

System process step
Validation
Calculation
Error handling
Database auditing

Security
Help text
User interface/navigation
Report layout
Screen layout

2.2.3.2. Module Integration Testing: Also known as link testing; at this level, software configuration analysts working directly with their Federal project team counterparts will conduct testing on the following functions as they apply to data transfer from one module into another, such as Accounts Receivable transaction posting to the General Ledger or Accrual Reversals impact on both General Ledger and Accounts Receivable balances:

System process step
Validation
Calculation
Error handling
Database auditing
Security
Help text
User interface/navigation
Integrated Report layout

2.2.3.3. Financial Suite Systems Testing: At this level, a testing team other than the team(s) that conducted testing at the prior levels is utilized. Testing at this level samples the module/module integration testing that has already occurred and confirms the expected results. In addition, this level is where parallel testing is structured and initiated. The following represents the kind of testing that will be conducted at this level:

System Period-End Close process sequence using scripted data
Manual data load
Converted data load
System Period-End Close process sequence using converted data
Parallel legacy reconciliation
Report Layouts
Distributed environment/WAN resource access
Backup and recovery
Database auditing
Record locking
Batch processing
Data archival
Initial system documentation

2.2.3.4. Platform Operating System Testing: This testing is directed at the IBM AIX operating system and its capabilities for managing the various components of the hardware platform such as the RAID 1 storage, redundancy/backup, and machine-to-machine communications & data transport. This testing will be performed on each platform installed for the BMIS-FM system – the Training platform, the Development platform and the Production platform.

2.2.3.5. Software Patch Regression Testing: Once the Financial Suite Systems Testing is satisfactorily complete and the tested functional baseline is established, Software Patch Regression Testing is conducted from this point forward to ensure the configured system continues to provide the expected functionality. It is quite likely that regression testing of patches will have occurred at earlier times as well. In such a case, regression testing is conducted iteratively by the team(s) responsible for testing at their appropriate level and module assignment.

2.2.3.6. Performance/Volume Testing: This testing will create and execute both baseline tests and peak activity tests to determine the configured systems' ability to satisfactorily meet the computer processing demands of the DOE financial community. This testing will focus on processing performance such as batch processing timeframes, backup timeframes, and on-line response time, as defined in the DOE RFP. The baseline testing occurs soon after the hardware systems are configured and connected to DOENet. This testing will establish baseline performance metrics that are a function of the DOE communications infrastructure, before BMIS-FM activity begins to establish its own performance metrics.

2.2.3.7. External Systems Interface Testing: This testing will be conducted in a manner that supports geographically disbursed source systems and disbursed technical support teams. Coordinating this testing will be detailed in the test plans designed for each external system. The coordination will be an overarching monitoring step with common practices built into each test plan. Common functional test scripts and common expected results documentation will be important to accurately determining the success of this testing.

2.2.3.8. Security Testing: This testing will be especially important as BMIS-FM functionality is deployed across multiple sites connected by DOENet. Securing functional access to BMIS-FM resources will be managed at the application level, using capabilities supplied by the Oracle software, and managed at the network level, using resource access capabilities provided by site firewall software and network operating system security. Coordination of BMIS-FM access will look to the model created for the CHRIS project to leverage best practice experiences learned during that deployment.

2.2.3.9. User Acceptance Testing: This testing occurs prior to cutting the BMIS-FM system over to production. User acceptance criteria is developed that includes the performance criteria stated in the BMIS-FM RFP as well as criteria yet to be developed as part of the User Acceptance Test activity. Such criteria can include screen layout/navigation, report formats, on-line response time, training evaluation results, system and user documentation and properly trained production support personnel.

2.2.3.10. IV&V Testing: This testing is expected to occur after satisfactory completion of the User Acceptance Test. BMIS-FM project team members will provide support to the IV&V evaluation team. The plan and schedule for IV&V testing will be determined after a third-party team is identified.

2.3. During the latter part of the Design Phase and throughout the Deploy Phase the IPT will develop and document a detailed testing plan that consists of detailed test events, test scripts, expected outcomes and test result log templates that will be applied to each testing level identified in the prior section.

2.4. The test environment will be built on the Development machine. It is quite likely that multiple test environments will be maintained – a “raw” test environment and a pre-production test environment. The pre-production test environment will most closely resemble the production environment. Three testing levels will be applied to this environment – Performance/Volume Testing, User Acceptance Testing and IV&V Testing.

2.5. Several testing roles have been identified. The roles shown in the table below will be filled by Integrated Project Team members**.**

2.5.1. The two IPT staff responsible for training planning and management are shown as Testing Lead 1 and Testing Lead 2.

2.5.2. It is expected that Test Software Analysts will be identified within the next 60-90 days. The Test Software Analysts will be responsible for assisting with developing and executing test events, test scripts and recording test outcomes..

2.5.3. The Quality Assurance (QA) role is primarily responsible for ensuring that the testing function accurately addresses all functional capabilities identified as eligible for testing in the test plans and that outcomes for each test script are documented and closed as PASS, PASS WITH EXCEPTION, or FAIL.

2.5.4. Any script logged as PASS WITH EXCEPTION or FAIL will be submitted for additional review, diagnostics and mitigation.

2.5.5. The Security Liaison role will work with network security engineers and application security designers to ensure the BMIS-FM environment properly complies with the Department security objectives, policies and guidance.

2.5.6. Liaison with the IV&V testing team will fall predominately with the Testing Leads, however it is quite likely that extensive support from Test Software Analysts as well as from other Design and Configuration staff will be required.

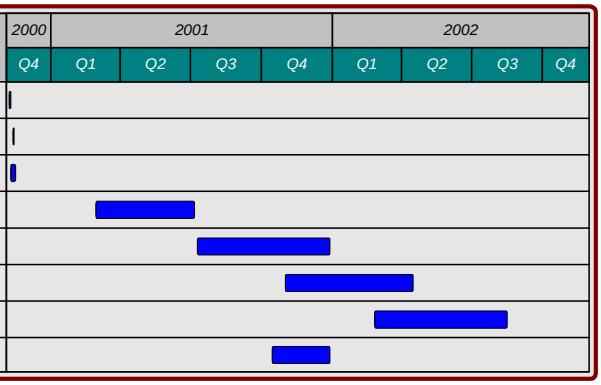
TESTING ROLES AND STAFF ASSIGNMENTS

Project Role	**Name**	**Org**	**Contact Info**
Program Manager	Michael Fraser	DOE/CR-60	301.903.1428
Project Manager	Don Cox	Team IBM	301.903.1525
Testing Lead -1		DOE/CR-60	
Testing Lead -2	Ben Joyce	Team IBM	703.928.1143
Test Software Analyst			
Test Software Analyst			
Test Software Analyst			
Quality Assurance Manager	Ben Joyce	Team IBM	703.928.1143
Security Liaison			

3. Preliminary BMIS-FM Testing Schedule

The preliminary schedule shown below shows the “when” aspects of the testing strategy.

ID	Task Name	Start Date	End Date	Duration
1	Prepare Testing Strategy Workshop	11/08/2000	11/09/2000	2d
2	Conduct Testing Strategy Workshop	11/13/2000	11/13/2000	1d
3	Define & Document Testing Strategy	11/10/2000	11/15/2000	4d
4	Define Detail Test Plans	02/28/2001	07/05/2001	92d
5	Conduct BMIS-FM Testing re:CAP Center	07/10/2001	12/28/2001	124d
6	Conduct BMIS-FM Testing re:ALO Center	11/01/2001	04/15/2002	118d
7	Conduct BMIS-FM Testing re:ORO Center	02/25/2002	08/15/2002	124d
8	Conduct BMIS-FM Testing re:FICOR	10/15/2001	12/28/2001	55d



(Timeframe is based on calendar year)

4.